CERL Helps Students Construct Solar Fountain

by Amanda Ehmann

With help from ERDC-CERL fifth-grade students in Champaign had the opportunity to see that “fun in the sun” can be a real learning experience.

On May 8, students at Barkstall Elementary held a dedication ceremony for the solar fountain that *they* built. Through an Education Partnership Agreement (EPA) with Champaign Unit Four School District, ERDC-CERL energy researcher Roch Ducey worked with students to teach them about the solid-state physics of a photovoltaic (PV) cell, the basics of electricity, and the astronomy of the sun at different times of the day and the year. He did this with a goal to “instill in them an interest in science, a scientific curiosity.” He also helped submit a proposal for an $800 award from the Central Illinois Section of the Institute of Electrical and Electronic Engineers (IEEE), which was awarded and matched by the Barkstall Parent/Teacher Association (PTA).

About 25 fifth-grade students wrote their own grant proposals, describing how they might contribute to the project. Barkstall science teachers and PTA Building and Grounds Committee Chair Karen Cottrell, who Ducey calls “an instrumental member of the project and a primary reason for its success,” then selected eight of the student proposals and those students participated in the design and construction phase of the project.

The fountain pump, typically used as a bilge pump on boats, is connected directly to a 65-watt solar panel, so there are no batteries or switches involved. The solar panel is usually used to recharge 12-volt batteries, like those in automotive and marine systems. Ducey said it is a “simple technology” and explained how it works like this “a solar cell converts light energy into direct current (DC) electricity; so, when the sun shines, the fountain flows.”

The students were familiar with laser-emitting diode (LED) lights and solar power is the opposite of that. With solar energy you shine light on the cell to

Roch Ducey and Barkstall students with the completed solar fountain.

produce electricity. Ducey was “really understood how the current was created and water flow was produced.

After several field trips to garden centers and stone companies, the students selected the stones, came up with a free-flowing design and began the most exciting stage, the construction. It took about four days to build the fountain, with students assembling the stones themselves. This was Ducey’s favorite part of the project because “the students were so excited and enthusiastic.”

Along with hands-on science, students were taught about project management. Cottrell explained the project’s resources and expenses and helped the students to create a spreadsheet for managing them. This was also a good teamwork exercise, since everyone had to work together and agree on the design and construction tasks.

Although Ducey is not currently collaborating on a Unit Four EPA project, he does plan to continue working with local students. He has hopes to work with junior high and high school students on a wind energy project and the new fuel cell technologies.

The Education Partnership Agreement, with Champaign Unit Four was established about a year ago. Project Coordinator Elon Zeigler explained its purpose as “a way to work with schools in a united effort.” ERDC-CERL and Unit Four have established a working relationship to enhance the study of science. Other researchers have volunteered under the agreement on such projects as Science Olympiad and Lego Robotics.

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